

IN THE CLAIMS:

1. (Currently Amended) A method of controlling a process of fabricating integrated devices on a substrate, comprising:

measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate;

adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures; and

executing a multi-pass process wherein the substrate is processed more than once by a measurement process, an etch process, and at least one post-etch process while forming the at least one structure, wherein the etch process is performed in an etch reactor and wherein the at least one post-etch process is performed in substrate processing equipment external to the etch reactor.

2. (Cancelled)

3. (Previously Presented) The method of claim 1, wherein the measuring step further comprises:

detecting a failure of processing equipment performing at least one pre-etch process and/or the at least one post-etch process.

4. (Original) The method of claim 1, wherein the structures are selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.

5. (Original) The method of claim 1, wherein the measuring step uses a non-destructive measuring technique.

6. (Original) The method of claim 1, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.

7. (Original) The method of claim 6, wherein the measuring step further comprises:

measuring thickness of the structures using the at least one in-situ measuring tool.

8. (Original) The method of claim 1, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.

9. (Previously Presented) The method of claim 8, wherein the measuring step further comprises:

measuring topographic dimensions and/or thickness of the structures using the at least one ex-situ measuring tool.

10. (Previously Presented) The method of claim 9, wherein the at least one ex-situ measuring tool and the etch reactor are modules of a processing system.

11. (Previously Presented) The method of claim 1, wherein the measuring step is performed external to a processing system utilized to perform the etch process.

12. (Original) The method of claim 1, wherein the adjusting step further comprises:

adjusting the process recipe of an etch process for etching at least one subsequent substrate.

13. (Previously Presented) The method of claim 53, wherein the at least one pre-etch process is performed before measuring the pre-etch dimensions.

14. (Original) The method of claim 1, wherein the at least one post-etch process is performed after measuring the post-etch dimensions.

15. (Previously Presented) The method of claim 1, wherein the at least one post-etch process is selected from a group consisting of a chemical mechanical polishing process, a deposition process, an etch process, an oxidation process, an annealing process and a lithographic process

16. (Original) The method of claim 1, wherein the pre-etch measurements are taken in a device coupled to a processing system having a processing chamber in which the etch process is performed.

17. (Previously Presented) The method of claim 1, wherein the pre-etch measurements are taken in a device remote from a processing system having a processing chamber in which the etch process is performed.

18. (Original) The method of claim 1, wherein the step of adjusting further comprises adjusting end point detection parameters.

19. (Original) The method of claim 1 wherein the at least one structure is a capacitive structure of a trench capacitor on a substrate.

20. (Original) The method of claim 19, wherein the capacitive structure comprises a polysilicon electrode layer.

21. (Original) The method of claim 20, wherein the process recipe of the etch process further comprises:

providing HBr and Cl₂ at a flow ratio HBr:Cl₂ in a range from 1:15 to 15:1.

22. (Withdrawn – Currently Amended) A computer-readable medium containing software that when executed by a computer causes a semiconductor wafer processing system to control a process of fabricating integrated devices on a substrate using a method, comprising:

measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate;

adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures; and

executing a multi-pass process wherein the substrate is processed more than once by an etch process and at least one post-etch process while forming the at least one structure, wherein the at least one post-etch process is selected from a group consisting of a chemical mechanical polishing process, a deposition process, an etch process, an oxidation process, an annealing process and a lithographic process, wherein the etch process is performed in an etch reactor and wherein the at least one post-etch process is performed in substrate processing equipment external to the etch reactor.

23. (Withdrawn) The computer-readable medium of claim 22, wherein the measuring step further comprises:

detecting a failure of processing equipment performing the at least one post-etch process.

24. (Withdrawn) The computer-readable medium of claim 22, wherein the structures are elements of the integrated devices selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.

25. (Withdrawn) The computer-readable medium of claim 22, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.

26. (Withdrawn) The computer-readable medium of claim 22, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.

27. (Withdrawn) The computer-readable medium of claim 26, wherein the at least one ex-situ measuring tool and the etch reactor are modules of a processing system.

28-35. (Cancelled)

36. (Currently Amended) A method of controlling a process of fabricating integrated devices on a substrate comprising:

executing a multi-pass process, wherein the substrate is processed more than once by at least one measurement process, an etch process and at least one pre-etch process and/or at least one post-etch process while forming at least one structure on the substrate, where each time the substrate is processed by the etch process is a pass, and wherein the etch process is performed in an etch reactor and the at least one pre-etch process and the at least one post-etch process is performed in substrate processing equipment external to the etch reactor;

measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate, during each at least one measurement process; and

adjusting a process recipe of the etch process for etching the substrate and a process recipe of at least one pre-etch process and/or at least one post etch process using the results of measuring the dimensions on the structures.

37. (Original) The method of claim 36, wherein the measuring step further comprises:

detecting a failure of processing equipment performing the at least one pre-etch process and/or the at least one post-etch process.

38. (Original) The method of claim 36, wherein the structures are selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.

39. (Original) The method of claim 36, wherein the measuring step uses a non-destructive measuring technique.

40. (Original) The method of claim 36, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.

41. (Original) The method of claim 40, wherein the measuring step further comprises:

measuring thickness of the structures using the at least one in-situ measuring tool.

42. (Original) The method of claim 36, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.

43. (Previously Presented) The method of claim 42, wherein the measuring step further comprises:

measuring topographic dimensions and/or thickness of the structures using the at least one ex-situ measuring tool.

44. (Previously Presented) The method of claim 43, wherein the at least one ex-situ measuring tool and the etch reactor are modules of a processing system.

45. (Previously Presented) The method of claim 36, wherein the measuring step is performed external to a processing system utilized to perform the etch process.

46. (Original) The method of claim 36, wherein the adjusting step further comprises:

adjusting the process recipe of an etch process for etching at least one subsequent substrate.

47. (Original) The method of claim 36, wherein the at least one pre-etch process is performed before measuring the pre-etch dimensions.

48. (Original) The method of claim 36, wherein the at least one post-etch process is performed after measuring the post-etch dimensions.

49. (Original) The method of claim 36, wherein the at least one pre-etch process and/or the at least one post-etch process is selected from a group consisting of a chemical mechanical polishing process, a deposition process, an etch process, an oxidation process, an annealing process and a lithographic process.

50. (Original) The method of claim 36, wherein the pre-etch measurements are taken in a device coupled to a processing system having a processing chamber in which the etch process is performed.

51. (Previously Presented) The method of claim 36, wherein the pre-etch measurements are taken in a device remote from a processing system having a processing chamber in which the etch process is performed.

52. (Original) The method of claim 36, wherein the step of adjusting further comprises adjusting end point detection parameters.

53. (Previously Presented) The method of claim 1, further comprising:
adjusting a process recipe of at least one pre-etch process using the results of measuring the dimensions on the structures.